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Forecasting WTI Futures Prices Using Recurrent Neural Networks

羽森　茂之

Abstract

Within the context of crude oil futures pricing, this study compares the forecast performance of recurrent neural network (RNN)-based models to that of an autoregressive-generalized autoregressive conditional heteroscedasticity (AR-GARCH) model and a vector autoregression (VAR) model. For the RNN-based models, we use simple recurrent network, long short-term memory, and gated recurrent unit models, as well as hybrids thereof. Our empirical results indicate that RNN-based models outperform the AR-GARCH model and VAR model. We also find that neither adding the same type of layer nor combining different types of layers statistically significantly improves forecast performance.